

**DOCUMENTATION OF ENVIRONMENTAL
INDICATOR DETERMINATION**
Interim Final 2/5/99

**RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)**

Current Human Exposures Under Control

Facility Name:	Federal-Mogul Corporation
Facility Address:	300 Industrial Park Road, S.E., Blacksburg, VA 24060-6699
Facility EPA ID #:	VAD054039961

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

 X If yes - check here and continue with #2 below.
 If no - re-evaluate existing data, or
 If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration/Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale/Key Contaminants
Groundwater	<u>X</u>			See discussion under “Rationale and References”
Air (indoors) ²		<u>X</u>		See discussion under “Rationale and References”
Surface Soil (e.g., <2 ft)	<u>X</u>			See discussion under “Rationale and References”
Surface Water	<u>X</u>			See discussion under “Rationale and References”
Sediment		<u>X</u>		See discussion under “Rationale and References”
Subsurf. Soil (e.g., >2ft)	<u>X</u>			See discussion under “Rationale and References”
Air (outdoors)		<u>X</u>		See discussion under “Rationale and References”

_____ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter “IN” status code.

Rationale and Reference(s):

GROUNDWATER

TCE has been detected in onsite and offsite wells at concentrations above its MCL of 5 ug/l (URS 2003a and URS 2003b).

AIR (INDOORS)

Potential impacts to indoor air due to volatilization of TCE from impacted groundwater are considered for two locations: 1) Onsite at the Federal-Mogul plant, and 2) Offsite at residential locations.

Onsite at the Plant

Membrane interface probe survey (MIPS) data (URS 2003b) shows little or no detector responses for sample locations immediately adjacent to the plant. Thus, the opportunity for upward migration of TCE vapors and subsequent impact of indoor air within the plant is low.

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

Offsite at Residential Locations:

Residential locations of interest are houses with basements or slab on grade construction situated near the TCE plume. The focus is on off-site, non-trailer residences along Jennelle Road. Most of the residences near the plume are house trailers that are elevated and do not lie directly upon the ground surface; thus, there is no conduit for vapor migration into the residences (trailers).

The majority of the non-trailer residences have groundwater TCE concentrations below the TCE screening value; thus, vapor intrusion is not a concern (USEPA 2002). A conservative target risk level of 1×10^{-6} was used. Only one residence was identified where the groundwater concentration exceeded the TCE screening level indicating the need for additional site specific evaluation of indoor air. A TCE concentration of 18 ug/l in the groundwater from the former drinking water well at the residence was reported in 2003 (URS 2003b). The EPA's version of the Johnson & Ettinger Vapor Intrusion model was used to evaluate the site specific TCE vapor intrusion risk for the subject residence. Using the Johnson and Ettinger model and the TCE groundwater concentration of 18 ug/l, it is determined that the TCE groundwater concentration at this resident does not result in an indoor air risk due to TCE vapor intrusion.

SURFACE SOIL (E.G., <2 FT)

Presently, it is estimated that isolated areas of surface soil only at the plant site may contain hazardous constituents at concentrations in excess of risk based levels. The basis for this estimation includes the presence of small areas of visually stained soil associated with the following external SWMUs:

- Aluminum Dust Baghouse (External SWMU 20)
- Hazardous Waste Storage Area (Interior SWMU 6)
- Drainage Swale down gradient of external SWMUs 6 through 18

SURFACE WATER

During the summer of 2002, an offsite spring sample was collected from Virginia Department of Transportation (VDOT) property at a location immediately west of a residential property and north of Jennelle Road (URS 2003b). At this location, groundwater from the TCE plume first discharges to the surface. TCE and cis-1,2-DCE (TCE degradation product) were detected at concentrations of 36 and 1.4 ug/l, respectively.

SEDIMENT

The Virginia Department of Transportation (VDOT) has not detected TCE in any soil / sediment samples from the area proximate to the springs where TCE discharges to the surface via spring water (URS, 2003b).

SUBSURF. SOIL (E.G., >2FT)

Presently it is estimated that an area of subsurface soil at the plant (east of external HWMU 9; former Location of Drum Storage Pad) may contain hazardous constituents at concentrations in excess of risk-based screening levels, based upon the results of the 2003 MIPS (URS 2003b).

AIR (OUTDOORS)

Outdoor air is evaluated for the onsite area proximate to the plant and offsite for: 1) the VDOT property where TCE-impacted spring water discharges to the surface, and 2) a spring box on a residential property which contains TCE-impacted spring water.

Onsite at the Plant

No acute outdoor vapor sources such as lagoons, impoundments, highly contaminated surface soil, etc. are present at the plant. External vapor sources are limited to subsurface soils at isolated locations that contain low concentrations of volatile chemicals. The MIPS survey of 2003 (URS 2003b) did not identify impacted surface soils not covered with barriers such as concrete and asphalt. The combination of low concentrations, volatile chemicals occurrence primarily at depth (rather than near the surface), surficial barriers, and abundant mixing of potentially emitted vapors with ambient air results in no onsite outdoor air contamination.

Offsite at the VDOT Property

Offsite attention is on where impacted groundwater discharges to the surface as spring water. Groundwater surfaces as springs on VDOT property south of the plant and north of Jennelle Road. Water from this spring enters an unnamed drainage ditch and flows South through a long concrete culvert. Upon exiting the culvert, the surface water continues to flow southward through another manmade ditch. Low concentrations of TCE in this spring water rapidly volatilize (URS, 2003b). Any emitted vapor occurs over a long surface water flow path and is diluted with large volumes of ambient air, resulting in no air contamination.

Offsite at the Residential Property

The spring box on the residential property has been covered with a locked box to isolate it from the residences.

USEPA, 2002. Draft Guidance For Evaluating The Vapor Intrusion to Indoor Air Pathway From Groundwater And Soils (Subsurface Vapor Intrusion Guidance); Office of Soiled Waste and Emergency Response; <http://www.epa.gov/correctiveaction/eis/vapor/guidance.pdf>

URS Corporation, 2003a. *2003 First Semi-Annual Report, Base Corrective Action Program, Federal-Mogul Corporation, Blacksburg, Virginia 24060-6699*, EPA ID NO. VAD05039961, August 2003.

URS Corporation, 2003b. Letter from URS to VADEQ dated September 2003 transmitting data from the residential studies conducted during the summers of 2002 and 2003.

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

<u>Contaminated Media</u>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	<u>NO</u>	<u>NO</u>		<u>YES</u>			
Surface Soil (e.g., <2 ft)	<u>NO</u>	<u>YES</u>		<u>YES</u>			
Surface Water	<u>NO</u>	<u>NO</u>		<u>YES</u>	<u>YES</u>	<u>NO</u>	
Subsurf. Soil (e.g., >2ft)	<u>NO</u>	<u>NO</u>		<u>YES</u>			

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not “contaminated”) as identified in #2 above.
2. Enter “yes” or “no” for potential “completeness” under each “Contaminated” Media--Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“___”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) -skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

X If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code Rationale and Reference(s):

Rationale and Reference(s):

GROUNDWATER

All residents who's former drinking water wells were impacted with TCE have been connected to the public water supply system. Also, legally binding agreements have been negotiated with the residents so that they can no longer access or utilize, in any way, groundwater from their former drinking water wells. The wells have been locked and secured, and the pumps removed. The wells remain for monitoring purposes only.

Workers do not use groundwater for any purpose.

Construction workers could incidentally contact groundwater for short periods of time during potential future construction activities involving excavation to depths on the order of 10 feet.

SURFACE SOIL

Workers and construction workers have access to potentially impacted soil areas for brief periods of time only at the plant site.

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

SUBSURFACE SOIL

Construction workers engaged in excavation activities only at the plant site could contact potentially impacted subsurface soil areas for brief periods of time.

SURFACE WATER

There are two focal points for Surface Water, these being where impacted groundwater surfaces on VDOT property and the residential spring.

TCE impacted groundwater surfaces at a location northwest of the Hall property and north of Jennelle Road. Water from this spring enters an unnamed tributary/drainage ditch that is partially lined with rip rap. This water then flows southward through a several hundred foot long concrete culvert beneath Jennelle Road and the Smart Road. Construction workers potentially involved in maintenance of the VDOT property drainage ditch could potentially contact impacted surface water for brief periods of time. Trespassers on the VDOT property could similarly contact the impacted surface water for brief periods. There is natural attenuation along the surface flow path. Where the water discharges from the culvert (approximately 450 feet south of the spring), a surface water sample was collected (on the same day that the above spring water sample was collected) to assess attenuation. The TCE and cis-1, 2-DCE concentrations in the down stream sample were 3.1 ug/l and non-detect, respectively, indicating significant attenuation to less than the 5 ug/l screening level.

Residential contact with the impacted spring box surface water is not possible. Access to the TCE-impacted spring is no longer possible because the spring has been secured with a locked cover and a warning sign is posted. Minor surface seeps resulting in wet soil downhill from the spring box are considered to represent an insignificant exposure potential due to the small volume and isolated nature of the seeps.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**⁴ (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

 X If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

 If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

 If unknown (for any complete pathway) - skip to #6 and enter “IN” status code.

Rationale and Reference(s):

GROUNDWATER

The infrequency of construction workers potentially contacting impacted groundwater and the ineffectiveness of the exposure route (incidental dermal contact) together render such exposure not significant.

SURFACE SOIL

The infrequency of workers and construction workers potentially contacting impacted surface soil render such exposure not significant. The area of potentially impacted surface soil at the Aluminum Dust Baghouse (External SWMU 20) is estimated at less than two square feet and is located at a portion of the plant infrequently visited by workers. Similarly, the drain pipe associated with Interior SWMU 6 and the Drainage Swale down gradient of external SWMUs 6 through 18 have only very small areas of impacted surface soil associated with them and are at locations not frequently visited by workers. Potential surface soil exposures associated with all of these areas are not significant.

SUBSURFACE SOIL

Construction workers engaged in excavation activities could potentially contact impacted subsurface soil areas for brief periods of time. These areas are limited to the plant site and are small and isolated, and health & safety procedures would preclude significant exposure.

SURFACE WATER

TCE could be dermally contacted for brief periods of time by trespassers and/or construction workers on VDOT property (Smart Road right-of-way) proximate to where the Smart Road crosses Jennelle Road. However, the brief nature of the exposure and the evaporation/air dilution of the TCE precludes significant exposure.

⁴ If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all “significant” exposures have been shown to be within acceptable limits) -continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

_____ If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code.

Rationale and Reference(s):

Not Applicable

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

 X YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Federal-Mogul Blacksburg facility**, EPA ID # **VAD054039961**, located at **300 Industrial Park Road SE, Blacksburg, VA 24060-6699** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

 NO - "Current Human Exposures" are NOT "Under Control."

 IN - More information is needed to make a determination.

Completed by	<u> (ORIGINAL SIGNED) </u> <u>Dennis G. Lund</u> <u>Environmental Engineer Senior</u>	Date <u> 9/29/03 </u>
Supervisor	<u> (ORIGINAL SIGNED) </u> <u>Leslie A. Romanchik</u> <u>Director, Office of Waste Permitting</u> <u>Virginia Department of Environmental Quality</u>	Date <u> 9/29/03 </u>

Locations where References may be found:

Commonwealth of Virginia
Department of Environmental Quality
Waste Division
629 East Main St.
Richmond, Virginia 23219

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FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.